C-6.14 Represent neutralization reactions and reactions between common acids and metals by using chemical equations.

Revised Taxonomy Levels 2.1 B Represent (interpret) conceptual knowledge

In physical science students

- Classify various solutions as acids or bases according to their physical properties, chemical properties (including neutralization and reaction with metals), generalized formulas, and pH (using pH meters, pH paper, and litmus paper). (PS-3.8)

It is essential for students to

- Use an "Activity Series Metals" table to predict whether a metal will replace hydrogen in a given reaction.

More Active

Less Active

Activity Series	
Metals	
Li	React with cold water and acids replacing hydrogen
Rb	
K	
Ba	
Sr	
Ca	
Na	
Mg	React with steam (but do not react with cold water) and acids replacing hydrogen.
Al	
Mn	
Zn	
Cr	
Fe	
Cd	
Co	Do not react with water. React with acids, replacing hydrogen
Ni	
Sn	
Pb	
hydrogen	
Sb	Do not replace hydrogen in water or in acids
Bi	
Cu	
Hg	
Ag	
Pt	
Au	

- Write balanced equations for the reactions between common acids and metals.
- Understand that neutralization of a strong acid and a strong base occurs when the concentration of hydrogen ions [H^+] and hydroxide ions [OH^-] are each at 1 x 10^{-7}M in the solution.
- Use stoichiometry and titration calculations to predict whether various ratios of acid concentration and volume to base concentration and volume will result in a neutral solution.
- Write balanced equations for the neutralization reactions between selected common strong acids and strong bases.

Assessment

The verb interpret (represent) means that one major focus of assessment will be for students to "change from one form of representation to another", in this case, to represent chemical reactions between metals and acids and between strong acids and strong bases with chemical formulas. As this indicator is classified as conceptual knowledge, it is vital that students can apply their knowledge of the chemical reactions of acids and their understanding of chemical equations to represent any given reaction which follows the pattern represented here.